

Claims

1. The peristaltic rotation pump with exact, especially mechanically linear dosing, consisting of a pump segment placed on a working path and a rotor with pressure rollers, characteristic by the fact, that the pump segment (1) is extended along the working path (24), which is transversally grooved at the place of contact with the compressed pump segment (1) and is adjacent within all its length to an elevated circular supporting occlusal path (3) for rolling of at least two pressure rollers (4), which are slidingly mounted in the pressure blocks (5), placed in the arms (23) of at least double-arm rotor (6), which is connected by shaft (9) with the step motor (10), while the supporting occlusal path (3) is elevated in the direction to the rotor 6 rotation centre above the transversally grooved working path (24) consisting of the lead-in path (15), occlusal path (2) and releasing path (16).
2. The peristaltic pump according to claim 1 characteristic by the fact that the pump segment (1) extends along the working path (24) and both ends of the pump segment (1) lean against the supporting surface (18) outside the working path (24), the pump segment (1) forms angle $\alpha = 90^\circ$ with the radius of the working path (24) at the point of diversion of the pump segment (1) from the working path (24).
3. The peristaltic pump according to claims 1 and 2 characteristic by the fact that the circular occlusal path (2) and nearly circular releasing path (16) is adjacent to an elevated circular supporting occlusal path (3) along its whole length, for rolling of at least three pressure rollers (4), while the angle length of the releasing path (16) corresponding to the distance from the point of the beginning of releasing the pump segment (1) to the point of complete release of the pump segment (1) by the pressure roller (4) is identical with that of the occlusal path (2) and the supporting occlusal path (3) is elevated above the occlusal path (2) by distance $d <$ than twice the width of the pump segment (1) wall, and at the point of absolute release of the pump segment (1) the supporting occlusal path (2) is elevated above the releasing path (16) by distance (k) at least equal to the external diameter of the pump segment (1).

4. The peristaltic pump according to claims 1 through 3 characterized by the fact that the rotor (6) is formed by at least a two-arm hollow profile (7), in which the whole inside space of each arm (23) of the hollow profile (7) is filled with a pressure block (5), each of them is split by a longitudinal partition (13) into two parts, there is a spring (8) placed in each part, the pressure blocks 5 are secured in each arm (23) of hollow profile (7) of the rotor (6) within the extent of its stroke by a pin (12) located in a longitudinal groove (13) of the pressure block (5) and goes through the first groove (14) made in the arm (23) of the hollow profile (7), the springs (8) are leant inside the pressure block (5) against the back wall of the slide mounting (5.1) in which there is a freely located a roller (4), the springs (8) are pre-stressed at the other end against the body (22) located in the hollow profile (7), the body (22) is fixed by a bayonet close to the shaft (9) of the step motor (10), the body (22) is at least trilateral prism.
- 15 5. The peristaltic pump according to claims 1,2 and 4 characterized by the fact that the rotor (6) has two arms and the body (22) is a tetralateral prism.
6. The peristaltic pump according to claims 1 through 4 characterized by the fact that the rotor (6) has three arms and the body (22) is a trilateral prism, the rounded corners (35) of which fit into the second socket (34) at the place of connection of the arms (23) of the hollow profile (7), the body (22) is fitted with a cylindrical protrusion (29), in which a securing spring (17) is placed, there are a securing groove (19) and an input groove (20) at the back of the body (22), for a securing pin (21) placed on the shaft (9), the width of the securing groove (19) at its most distant point from the axis of the cylindrical protrusion (29) is lesser than the diameter of the securing pin (21), then a pin (12) of the pressure block (5) fits into the first groove (14) symmetrically placed at the front of the rotor (6) hollow profile (7), the pin (12) locks at the same time into the appropriate second groove (33) of the control element (32) designed for handling the pressure blocks (5) when the rotor (6) is inserted into the working path (24), into which the pump segment (1) is pressed by expansion, the control element (32) is connected by thread with the cylindrical protrusion (29).

7. The peristaltic pump according to claims 1 through 6 characterized by the fact that the minimum length of the occlusal path (2) is defined by the size of the central angle of the rotor (6) rotation and is calculated from the formula $360^\circ / \text{number of arms (23) of the rotor (6)}$.
- 5 8. The peristaltic pump according to claims 1 through 7 characterized by the fact that the pressure block (5) is provided with guiding grooves (11) for transversal guiding of the pump segment (1) for the grooved occlusal path (2).
9. The peristaltic pump according to claims 1 through 8 characterized by the fact that the pressure roller (4) is a roll from a rolling bearing which slides by all its cylindrical surface in sliding mounting (5.1) of the pressure block (5).
- 10 10. The peristaltic pump according to claims 1 through 9 characterized by the fact that the sliding mounting (5.1) is finished with wiper blades (5.2) for removing possible dirt in both direction of rotation of the rotor (6), there are sockets (5.3) made on the head (5.4) of the pressure block (5) at the level of the blades (5.2)
- 15 11. The peristaltic pump according to claims 1 through 10 characterized by the fact that the length of stroke of the pressing block (5) moves in the range of 1.1 to 2.0 multiple of the external diameter of the pump segment (1).
- 20 12. The peristaltic pump according to claims 1 through 11 characterized by the fact that the pressure roller (4) is an electric conductor and when it gets to touch with the speed contact (25) or the position contact (26) located on the supporting occlusal path (3) at the place where the lead-in path (15) changes into the occlusal path (2) and with the common contact (27) placed opposite to them on the edge of the occlusal path (2), it is under electric current of very low voltage.
- 25 13. The peristaltic pump according to claims 1 through 12 characterized by the fact that the pressure roller (4) is magnetized.

AMENDED CLAIMS

[Received by the International Bureau on 12 August 2003 (12.08.03):
Claims 1, 2, 3, 4 and 6 amended, remaining claims unchanged (1 page)] *

Claims

1. The peristaltic rotation pump with exact, especially mechanically linear
5 dosing, consisting of a pump segment placed on a working path, which is
adjacent to an elevated circular supporting occlusal path and a rotor with pressure
rollers, characteristic by the fact, that the pump segment (1) is extended
along the working path (24), and both ends of the pump segment (1) lean against
the supporting surface (18) outside the working path (24), the working path is
10 transversally grooved at the place of contact with the compressed pump
segment (1) and is adjacent within all its length to an elevated circular
supporting occlusal path (3) on which at least two pressure rollers (4) roll,
which are freely slidingly mounted with their outside surface in hollow slide
mounting (5.1) of the pressure blocks (5) placed flexibly in the hollow arms
15 (23) of at least double-arm rotor (6), which is connected to a shaft (9) of the
step motor (10), while the supporting occlusal path (3) is elevated in the
direction to the rotor (6) rotation centre above the transversally grooved
working path (24) consisting of the lead-in path (15), occlusal path (2) and
releasing path (16).
- 20 2. The peristaltic pump according to claim 1 characteristic by the fact that the
the pump segment (1) forms angle $\alpha = 90^\circ$ with the radius of the working
path (24) at the point of diversion of the pump segment (1) from the working
path (24).
3. The peristaltic pump according to claims 1 and 2 characteristic by the fact
25 that the circular occlusal path (2) and nearly circular releasing path (16) is
adjacent to an elevated circular supporting occlusal path (3) along its whole
length, for rolling of at least three pressure rollers (4), and the supporting
occlusal path (3) is elevated above the occlusal path (2) by distance $d <$
than twice the width of the pump segment (1) wall, and at the point of
30 absolute release of the pump segment (1) the supporting occlusal path (2) is
elevated above the releasing path (16) by distance (k) less or equal to the
external diameter of the pump segment (1), while the angle length of the
occlusal path (2) equals to the angle length of the releasing path (16)

corresponding to the distance from the point where the pressure roller (4) starts releasing the pump segment (1) to the point of complete release of the pump segment (1) by the pressure roller (4), where the pressing force of the pressing roller (4) to the pump segment (1) is zero.

- 5 4. The peristaltic pump according to claims 1 through 3 characterized by the fact that the rotor (6) is formed by at least a two-arm hollow profile (7), in which the whole inside space of each arm (23) of the hollow profile (7) is filled with a pressure block (5), each of them is split by a longitudinal partition (13) into two parts, there is a spring (8) placed in each part, the pressure blocks (5) are secured in each arm (23) of hollow profile (7) of the rotor (6) within the extent of its stroke by a pin (12) located in a longitudinal groove (13) of the pressure block (5) and goes through the first groove (14) made in the arm (23) of the hollow profile (7), the springs (8) are leant inside the pressure block (5) against the back wall of the slide mounting (5.1) in which there is a freely located a roller (4), the springs (8) are pre-stressed at the other end against the body (22) located in the hollow profile (7), the body (22) is fixed by a bayonet close to the shaft (9) of the step motor (10), the body (22) is at least trilateral prism.
- 10 5. The peristaltic pump according to claims 1,2 and 4 characterized by the fact that the rotor (6) has two arms and the body (22) is a tetralateral prism.
- 15 6. The peristaltic pump according to claims 1 through 4 characterized by the fact that the rotor (6) has three arms and the body (22) is a trilateral prism, the rounded corners (35) of which fit into the second socket (34) at the place of connection of the arms (23) of the hollow profile (7), the front of the body (22) is fitted with a cylindrical protrusion (29), in which a securing spring (17) is placed, there are a securing groove (19) and an input groove (20) at the back of the body (22), for a securing pin (21) placed on the shaft (9), the width of the securing groove (19) at its most distant point from the cylindrical protrusion (29) axis is lesser than the diameter of the securing pin (21), then a pin (12) of the pressure block (5) fits into the first groove (14) symmetrically placed at the front of the rotor (6) hollow profile (7), the pin (12) locks at the same time into the appropriate second groove (33) of the control element (32) designed for handling the pressure blocks (5) when the
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rotor (6) is inserted into the working path (24), into which the pump segment (1) is pressed by expansion, the control element (32) is connected by thread with the cylindrical protrusion (29).

7. The peristaltic pump according to claims 1 through 6 characterized by the
5 fact that the minimum length of the occlusal path (2) is defined by the size of the central angle of the rotor (6) rotation and is calculated from the formula $360^\circ / \text{number of arms (23) of the rotor (6)}$.
8. The peristaltic pump according to claims 1 through 7 characterized by the
10 fact that the pressure block (5) is provided with guiding grooves (11) for transversal guiding of the pump segment (1) for the grooved occlusal path (2).
9. The peristaltic pump according to claims 1 through 8 characterized by the fact that the pressure roller (4) is a roll from a rolling bearing which slides by all its cylindrical surface in sliding mounting (5.1) of the pressure block (5).
- 15 10. The peristaltic pump according to claims 1 through 9 characterized by the fact that the sliding mounting (5.1) is finished with wiper blades (5.2) for removing possible dirt in both direction of rotation of the rotor (6), there are sockets (5.3) made on the head (5.4) of the pressure block (5) at the level of the blades (5.2)
- 20 11. The peristaltic pump according to claims 1 through 10 characterized by the fact that the length of stroke of the pressing block (5) moves in the range of 1.1 to 2.0 multiple of the external diameter of the pump segment (1).
12. The peristaltic pump according to claims 1 through 11 characterized by the
25 fact that the pressure roller (4) is an electric conductor and when it gets to touch with the speed contact (25) or the position contact (26) located on the supporting occlusal path (3) at the place where the lead-in path (15) changes into the occlusal path (2) and with the common contact (27) placed opposite to them on the edge of the occlusal path (2), it is under electric current of very low voltage.
- 30 13. The peristaltic pump according to claims 1 through 12 characterized by the fact that the pressure roller (4) is magnetized.